The Influence of Spring Festival on Chinese Gasoline Price

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Abstract. The highly uncertain nature of the globalised and diversified oil market has resulted in complex and volatile oil prices, which have attracted widespread international attention. In the author's previous research, the changes in petrol prices before and after Chinese New Year in the Chinese community in Sydney, Australia, were found to be very different from those in other parts of Sydney. The author speculated that the abnormal fluctuations in gasoline prices were caused by festivals. Therefore, in this paper, the author explored whether gasoline prices in China had the same changes by examining the changes in the gasoline market in China before and after the Spring Festival. This paper selected the gasoline price data in Beijing, Shanghai and Guangdong for the whole year of 2021 and the first half of 2022 for statistical analysis. Then the results were compared with the change in petrol prices in Australia during the Chinese New Year. The paper concludes that petrol prices are indeed influenced by the Chinese New Year, but also by specific time and events, such as technological developments, the impact of war on the global economy including petrol market prices and the global spread of COVID-19.

Keywords: Gasoline prices · spring festival · influential factors · Chinese market

1 Introduction

With the development of technology and the progress of the times, people's average income has increased and more and more people will choose to buy cars as their daily means of transport. As people inevitably have to refuel their cars during their daily travels, it is easy to see that the price of petrol is closely linked to people's lives, making it a very important market for consumers. Petrol prices have a unique price dynamic that can be treated as a stand-alone system and there is a wealth of data available for analysis. On the other hand, in addition to meeting the needs of the national economy, the storage and transportation of petrol is an important part of the worldwide energy security system and is important for ensuring national defence security and economic security. Changes in the price of petrol can drive policy changes, and this market is attractive to both consumers and policy makers. It is for this reason that the authors have developed an interest in researching the petrol market.

The author's previous study looked at the petrol market in Sydney and analysed the price change cycle for petrol in Sydney in 2021, based on which it was found that there

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were anomalies in petrol stations in the Chinese part of Sydney, Australia, that did not fit the overall pattern of change [1].

After comparison, it was found that the main reason for the change was the anomaly in petrol prices due to the Chinese New Year when people were visiting friends and relatives and the petrol usage rate was high. The ACCC survey report shows that the phenomenon of the impact of holidays on petrol prices is universal, not only the Chinese New Year but also other holidays in Australia can cause anomalous changes in petrol prices [2]. This paper aims to investigate the impact of Chinese New Year on petrol prices in China by analogy with the price anomalies in the Chinese New Year period in Australia.

Three methods are used for this research.

The first literature review method, through the Internet, books, newspapers, academic reports, conference materials, etc. The documents about dry dissertation writing are collated, and the literature that is related to the dry dissertation is screened to get the information that meets the research of the topic.

The second survey research method, through the survey of Chinese oil companies to get the gasoline price market data, and combined with the changes of data between different years or different months to study.

The third method is the summary method, which requires a lot of data to be consolidated and many of them need to be modified before they can be used in the actual content of the thesis.

2 Literature Review

Reviewing the authors' previous university report, a dataset of retailer price changes throughout 2021 was used to investigate different retailer brands and offline petrol stations to determine this price cycle. Influences will be analysed from multiple perspectives, such as price changes in fuel prices over several months for the same retailer, or price changes in the same month for different retailers in Sydney. It will be observed whether the conclusions drawn from the data can be generalised for use by retailers and consumers. The petrol market in Sydney can be found to have a stable cyclical cycle, i.e. the Edgeworth model [1]. However one petrol site in the Chinese Quarter violated this cycle during the Chinese New Year period, so the authors deduced that the price anomaly at this site stemmed from the time and location of the site, i.e. the Chinese Quarter and the Chinese New Year. This finding provoked the authors to think about the topic of this paper, the study of the Chinese petrol market during the Chinese New Year, and advanced it. In order to draw general conclusions, the authors refer to a number of studies on the Chinese gasoline market, according to the previous research, gasoline demand increased driven by the Chinese New Year factor [3].

In January, as the Chinese New Year approached, factories around the world went on holiday and shut down their operations, with diesel end-use falling off significantly, while gasoline demand picked up slightly due to increased pre-season traffic and restocking operations. February, coinciding with the Chinese New Year, diesel end-use demand was at a low ebb, with oil use mostly focused on digesting stocks, while gasoline demand picked up slightly due to the Chinese New Year return to home and cities. In March, due to

the end of the Spring Festival peak, the weather has not yet warmed up and hazy weather increased, gasoline terminal demand was suppressed [4]. In January 2012, the demand for stocking up for the Chinese New Year holiday will boost the market demand. On the supply side, Sinopec's resource supply may still be zero-based, while PetroChina's gasoline inventory is high, and with the addition of blended gasoline, gasoline resources may continue to outstrip demand. If international oil prices do not fluctuate significantly, the gasoline market is expected to remain relatively weak. On the demand side, market demand may be boosted by the Chinese New Year holiday stockpiling, with end-users' stocks at a low level after a month of resource digestion. During the Chinese New Year period, end-users' consumption is high and inventories are declining relatively quickly, so petrol stations will need to replenish their stocks, which will boost petrol consumption to a certain extent.

In order to interpret these phenomena, this paper refers to many factors affecting the demand for oil, the main factors can be summarised as economic growth, oil prices and alternative energy prices [5]. Firstly, as one of the most important raw materials in the modern economy, the rise in economic activity is usually accompanied by a rise in the demand for oil. Although there are differences in the growth rates of oil consumption and economic growth, the tendency to increase in tandem is still apparent. Secondly, oil price fluctuations have a significant impact on world oil consumption, but this impact is more likely to be a long-term lag. Thirdly, oil as an energy source is not a perfect substitute, but there is competition with other energy sources for all its uses. In the short term, natural gas is the main alternative to oil. In the long term, coal is also a major alternative to oil, and nuclear energy can also influence the price of oil.

The factors influencing the supply of oil can be divided into three categories: long-term, medium-term and short-term factors. Long-term influences come from resource reserves, while medium-term influences come mainly from production fluctuations, which are influenced and controlled by OPEC and non-OPEC. Short-term influences come from inventories, which profit from the difference in oil prices between periods, and are adjusted in response to price fluctuations.

3 Method

The main method of this research comparative analysis and statistical analysis. In order to make the study more general, the authors collected tables of oil price changes in different provinces and cities, namely Beijing, Shanghai and Guangzhou, three of China's most developed and most representative municipalities or provinces. In order to make the study more relevant, the author focused on the Chinese New Year period (around January to March).

4 Results and Discussion

The trend of petrol prices at different times was found to be very different through the different data collections. The trend of petrol prices in Beijing in 2021 and 2022, for example, is similar to that of the Chinese region of Australia in 2022, but the opposite is true for 2021.

According to statistics, oil prices around Chinese New Year 2021 (i.e. around January to March) are low and relatively stable [6–8]. It is highly likely that this is due to the epidemic period in 2021 and the laws and regulations in China that prohibit people from gathering in large numbers [6–8]. Therefore the number of visits to friends and relatives around the Chinese New Year is restricted.

With this restriction on travel, people will use their cars less often, which in turn will reduce the incentive to buy petrol. When petrol sales are not very high, the petrol market will maintain a low and stable trend in order to attract consumers to buy. Then compare this to the data for Chinese Australia mentioned earlier, in 2007. During the Chinese New Year, petrol prices in the Chinese region showed a high and stable trend. This is because at that time of year there was no global impact from the new crown epidemic. Therefore, during the Chinese New Year in 2007, people would visit their friends and relatives much more frequently, which in turn stimulated people's desire to buy balls. As a result, the market price of petrol naturally went up. In order to make the paper more scientific, the authors analyse the technological gap caused by the time span. After all, the time span between 2007 and 2021 is too large. 2021 is the year of the epidemic and people are restricted from travelling and gathering, but thanks to the development of smartphones, people can greet and wish their friends and family via video, yet in 2007. Technology was not as advanced, people did not utilise their mobile phones as much as they do now, and mobile phones did not have these video capabilities in 2021, so people were very eager to travel at that time and wanted to drive to see their families [9, 10].

Oil prices increased rapidly around the Chinese New Year in 2022, with petrol prices in that market showing a significant increase compared to 2021 [6–8]. A comparison of the Australian data will show that petrol prices in the Chinese part of Australia were in a high and stable state in 2007, which does not match the petrol prices around Chinese New Year in 2022, but this is not to say that the latter price trend is not unusual. What both have in common is that petrol prices are anomalous around Chinese New Year, and the reasons for the Australian petrol market are as described in the previous section.

The next analysis addresses the reasons for the anomalous change in petrol around Chinese New Year 2022. Prior to this analysis, the authors identified a problem: why are the petrol market prices in 2022 so different from 2021 in the same global epidemic environment. According to Liu, Li and Wang (2009), it can be found that political and military events are one of the main factors influencing the rise and fall of oil prices in the short term, and even the most direct cause of a significant steep rise or fall in oil prices in a short period of time [5]. Representative events are as follows: the first oil crisis was due to the Arab-Israeli war. In the late 1970s a political revolution in Iran, a major oil-producing country in the Middle East, triggered a second oil crisis, with oil prices rocketing 20 times higher than they had been in the early 1970s [11]. Gradually, oil become less and less of a commodity and more and more of a political, economic and financial commodity. Almost all major price movements are inextricably linked to economic and political events in major oil-producing countries and regions. The US sub-prime mortgage crisis and the devaluation of the US dollar led to a spike in the price of oil, the best form of oil to preserve its value, and its financial attributes began to emerge.

As in the Spring of 2022, the war between Russia and Ukraine has had a huge impact on gasoline. The first is that the war will affect transportation. Russia has oil and gas pipelines to Europe that pass through northwestern Ukraine, and now that Russia has invaded Ukraine, oil transportation will be affected. The second is that it will affect crude oil production. Russia is the world's leading producer of crude oil, with the third largest production volume in the world, after the United States and Saudi Arabia, accounting for about 12.5% of the global oil market.

The Russia-Ukraine war has a huge impact on Russia's domestic crude oil production and the fact that the war is located in the Middle East - an international oil supply region - has also had a significant impact on total world oil production. Thirdly, there is the knock-on effect that the Russia-Ukraine war will lead to European sanctions against Russia and a reduction in crude oil and gas imports from Russia. The result of this is that there will be a severe shortage of crude oil and gas supplies in Europe, and crude oil imports from other countries such as the US will not only be expensive but will not be able to meet demand. The result will be an increase in the price of oil and gas, which in turn will lead to an increase in global energy prices. Petrol is derived from oil. It is this combination of factors that has caused the market price of petrol in China to rise for a short period of time, showing a trend towards abnormal prices [12].

5 Conclusion

Petrol market price changes in China during the Chinese New Year period show different characteristics and are inconsistent with those in the Chinese part of Australia in 2007, reflecting differences due to the influence of temporal and spatial factors. 2021, petrol prices in Beijing were relatively stable around the Chinese New Year, which was influenced by COVID-19. Gasoline prices in 2022, also during the epidemic, increased significantly due to the war between Russia and Ukraine.

This finding will give the reader food for thought when looking at the market price of petrol in the future, for example, the increased frequency of travel during spring holidays, the global impact of COVID-19 or the impact of major world events on the petrol economy, as it is important for this field of study to look at the market changes in petrol from multiple perspectives and analyse the main causes of price fluctuations. It is also important to look at the possibility of anticipating and preventing major events, such as the increase in energy reserves, including gasoline, in the run-up to the war between Russia and Ukraine.

Based on this study, the future research could focus on the impact of different seasons on petrol price changes, rather than just around the Chinese New Year. Besides, large amount of data and correlation analysis can be used.

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